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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,524	02/13/2004	Yong-Kuk Yun	8054-38 (LW9081US/CS)	8916

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EXAMINER	
TADESSE, YEWEBDAR T	
ART UNIT	**PAPER NUMBER**
1734	

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/779,524	YUN ET AL.	
	Examiner	Art Unit	
	Yewebdar T. Tadesse	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,21,22 and 25-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,21,22 and 25-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 1-11, 21-22 and 25-30 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1 and 22, applicants claim, "each head unit is fixed in a position spaced apart from a previous head unit by a predetermined horizontal shift distance". It is unclear relative to what element each head unit is shifting. As recited In the previous amendment filed on 06/09/2006 and recited in the applicant's specification pages 9-10 and Figs 3-4 each head unit being shifted a horizontal distance from a previous head unit; and on page 15 applicants teach the spraying device is fixed and the transferring device transfers a mother substrate disposed on the stage. For the purpose of examination "each head unit is fixed or disposed in a position spaced apart from a previous head unit by a predetermined horizontal shift distance relative to the substrate disposed on the stage.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3-11, 21 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawase et al (US 6,660,332) in view of EP 0754553.

As to claims 1 and 10-11, Kawase et al discloses (see Figs 1-4) an apparatus for forming an organic layer on a substrate (an apparatus for making color filter), having a spraying device comprising a plurality of head units (ink-jet heads 22a-22k) forming in a corresponding row, wherein each head unit includes at least one head (a head) having spraying nozzles (27); and is spaced apart from a previous head unit by a predetermined horizontal shift distance (see a scanning distance δ in the scanning direction Y). Kawase et al further discloses spraying nozzles having a pitch between neighboring spraying nozzles (distance between adjacent nozzles 27), wherein the device is capable of being sized as having head unit spaced apart from previous head by a predetermined horizontal shift of the plurality of head units, wherein the spraying

nozzles have a pitch between neighboring spraying nozzles, whereby a multiple of the predetermined shift distance is capable of being identical to the pitch or the horizontal shift distance is less than the pitch (the nozzle pitch is greater than the horizontal shift distance). Kawase lacks teaching that each head unit is fixed in a position relative to the substrate disposed on the stage. However it is well known in the art to shift head unit relative to the substrate by having the spray head unit move relative to the substrate fixed on the stage as taught by Kawase or move the substrate disposed on the stage while having fixed head units such as taught by EP'553 (see column 27, line 56-column 28, line 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to alternatively have each head unit fixed in a position relative to the substrate disposed on the stage in Kawase since the ink-jet heads and the substrate relatively move as taught by EP'553.

As to claim 3, Kawase et al discloses a stage (table 49, see Fig 8) that supports the substrate.

As to claim 4, Kawase et al discloses (see Fig 16) a storage tank (ink supply units 37) that stores organic material provided to the spraying device.

As to claim 6, Kawase et al discloses (see column 25, lines 29-33) an inkjet head using a piezoelectric device.

As to claims 7-8, Kawase et al discloses (see Fig 1 for an angle θ) ink-jet heads inclined at predetermined angle (capable of being in the range of about 0° to about $\pm$ 89°) with respect to a side (second scanning direction) of the substrate.

As to claim 9, Kawase et al discloses (see Fig 8) a transferring device (substrate position controller 18) that transfer the stage (table 49) in a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

Regarding claim 21, Kawase et al discloses (see Figs 1-4) spraying nozzles arranged in a line (see nozzle line 28).

With respect to claim 29, in Kawase et al the organic materials are sprayed from the spraying nozzles to form the organic layer having substantially uniform thickness (see column 19, lines 14-22; column 25, line 65-column 26, line 9).

6. Claims 1-11, 21, 22 and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawase (US 2003/0186613) in view of EP 0754553.

Regarding claims 1-2 and 10-11, Kawase discloses (see Fig 9) an apparatus for forming an organic layer on a substrate (an apparatus for making color filter), having a spraying device comprising a plurality of head units (droplet ejection unit 25A, 25B and 25C) forming in a corresponding row, wherein each head unit includes at least one head (22) having spraying nozzles (27); and is spaced apart from a previous head unit by a predetermined horizontal shift distance (see Fig 9, for different positions of the ejection Units P21-P26). Kawase further discloses (see Fig 9 and paragraph 158) each head unit comprising a plurality of heads (22) alternatively disposed in first and second sub rows to form a zigzag pattern on the head unit (25), wherein the spraying nozzles have

a pitch between neighboring spraying nozzles. Kawase's device is capable of having a multiple of predetermined horizontal shift distance between the head units, which is capable of being identical to the pitch and or the horizontal shift distance is less than the pitch (the nozzle pitch is greater than the horizontal shift distance). Kawase lacks teaching that each head unit is fixed in a position relative to the substrate disposed on the stage. However it is well known in the art to shift head unit relative to the substrate by having the spray head unit move relative to the substrate fixed on the stage as taught by Kawase or move the substrate disposed on the stage while having fixed head units such as taught by EP'553 (see column 27, line 56-column 28, line 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to alternatively have each head unit fixed in a position relative to the substrate disposed on the stage in Kawase since the ink-jet heads and the substrate relatively move as taught by EP'553.

As to claim 3, Kawase discloses a stage (table 49, see Fig 16) that supports the substrate.

As to claim 4, Kawase discloses (see Fig 1) a storage tank (ink supply units 37) tat stores organic material provided to the spraying device.

As to claim 6, Kawase discloses (see paragraph 220) an inkjet head using a piezoelectric device.

As to claims 7-8, Kawase discloses (see Fig 1 for an angle θ) ink-jet heads inclined at predetermined angle of being larger than 0° and smaller than 90°) with respect to a side (scanning direction) of the substrate.

As to claim 9, Kawase discloses (see Fig 16, paragraphs 166-168) a transferring device (substrate position controller 18) that transfer the stage (table 49) in a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

Regarding claim 21, Kawase discloses (see Figs 1-4) spraying nozzles arranged in a line (see nozzle line 28).

With respect to claim 22, Kawase discloses (see Figs 9 and 16) an apparatus for forming an organic layer (an apparatus for making color filter), having a spraying device comprising a plurality of head units respectively disposed in first to nth rows wherein n is an integer greater than 1, (droplet ejection unit 25A, 25B and 25C, see three rows on Fig 9), each head unit being spaced apart from a previous head unit by a predetermined horizontal shift distance relative to the substrate disposed on the stage (different positions of the ejection Units P21-P26), wherein each head unit including a plurality of heads having spraying nozzles (27); and a transferring device (substrate position controller 18) that transfers the substrate in a printing direction. Kwase further discloses (see Fig 9 and paragraphs 41, 155 and 252) the spraying nozzles (27) arranged in a line (nozzle line 28), and have a pitch between neighboring spraying nozzles. In Kawase the pitch is capable of being identical to n times the predetermined horizontal shift distance because the pitch or distance between nozzles depends on the desired pixels formed on the substrate. In any event, Kawase et al's device is capable of having a nozzle pitch equals to the horizontal shift distance or n times the shifting

predetermined horizontal shift distance by controlling the shifting distance of the ejection units relative to the substrate. Kawase lacks teaching that each head unit is fixed in a position relative to the substrate disposed on the stage. However it is well known in the art to shift head unit relative to the substrate by having the spray head unit move relative to the substrate fixed on the stage as taught by Kawase or move the substrate disposed on the stage while having fixed head units such as taught by EP'553 (see column 27, line 56-column 28, line 5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to alternatively have each head unit fixed in a position relative to the substrate disposed on the stage in Kawase since the ink-jet heads and the substrate relatively move as taught by EP'553.

With respect to claim 25, Kawase discloses (see Fig 9 and paragraph 158) each head unit comprising a plurality of heads (22) alternatively disposed in first and second sub rows to form a zigzag pattern on the head unit (25).

As to claim 26, in Kawase (see Fig 9) the first heads overlaps with adjacent second heads to maintain a uniform distance between droplets of the organic material.

Regarding claim 27, in Kawase (see paragraphs 155, 206 and 209) the spraying device forms an angle with respect to the side of the substrate.

As to claim 28, in Kawase (see Fig 16 and paragraphs 166-168) a first printing direction and a second printing direction that is opposite to the first printing direction and a third direction that is perpendicular to the first printing direction (a first scanning direction and a second direction perpendicular to the first).

With respect to claim 30, in Kawase et al (see paragraph 317) the organic materials are sprayed from the spraying nozzles to form the organic layer having substantially uniform thickness

Response to Arguments

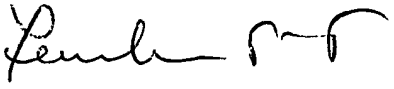
7. Applicant's arguments with respect to claim1-11, 22, 25-30 has been considered but are moot in view of the new ground(s) of rejection. As shown in the rejection above both Kawase et al (US 6,660,332) and Kawase (US 2003/0186613) in view of EP'553 disclose a plurality of head units, wherein each head unit fixed in a position spaced apart from a previous head unit by a predetermined horizontal shift distance relative to the substrate disposed on the stage. Applicants argue that Kawase refers to a single inkjet head not multiple inkjet heads. Examiner respectfully disagrees because applicants' claim 1 recites a plurality of head units, each head unit including at least one head having spraying nozzles. Kawase'332 discloses a plurality of head units (22a-22k), each head unit having a head (see Fig 10) having nozzles (27). Kawase '613 also discloses a plurality of head units (25A, 25B and 25C), each head unit comprising a plurality of heads (22), each having spraying nozzles (27). As such, Kawase et al '332 or Kawase'613 in view of EP'553 discloses the claimed elements as described above.

It is noted that in the applicant's amended claims 1 and 22, each head unit is fixed or disposed in a position, is considered to be "not moving" relative to the substrate disposed on the stage.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238: The examiner can normally be reached on Monday-Friday 8:00 AM-4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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